

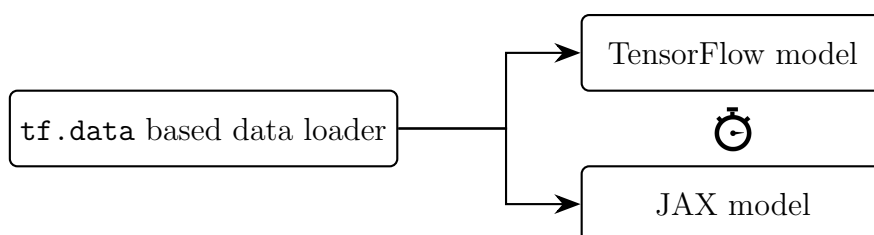


Project Thesis

Machine Learning with JAX

The diverse landscape of machine learning frameworks has recently grown by JAX¹. JAX makes use of XLA² and allows for execution on GPU, hence leading to significant performance gains over normal numpy code³ while maintaining numpy-like syntax. Moreover, built-in Autograd⁴ renders JAX an ideal basis for machine learning.

This project thesis aims at comparing the performance gains when using JAX over TensorFlow (TF). For this, an existing TF model has to be translated into one of the readily available neural network libraries built around JAX⁵. Please note that significant part of this thesis relies on TF code, hence experience in TF is required.



The scope of this work covers the following tasks:

- Literature review of ML libraries built around JAX,
- Choice of suitable library, translation of existing TF model to chosen library,
- Evaluation of chosen method against existing TF implementation.

Prerequisites:

- Demonstrated programming experience in Python,
- Knowledge of Neural Networks,
- Curiosity, excellent skills in independent work and communication.

¹<https://github.com/google/jax>

²*accelerated linear algebra*, <https://www.tensorflow.org/xla>

³<https://www.assemblyai.com/blog/why-you-should-or-shouldnt-be-using-jax-in-2023/>

⁴<https://github.com/hips/autograd>

⁵<https://github.com/n2cholas/awesome-jax>

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